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ABSTRACT

Noting that introducing students to cursive writing just when they have begun to master manuscript does not provide the continuity consistent with the rest of their education, a Montana school district implemented instruction in italic handwriting. The program was evaluated three years after implementation. Writing samples from all students in grades 1 through 6, 7, 9 and 11 were collected, including a timed sentence with all 26 letters of the alphabet. Fifty samples from each grade level were evaluated. Mean scores for the number of letters per minute were calculated for speed, and literature was reviewed to establish criteria for judging legibility and speed, which came to include size and slant of writing, and form, alignment, and spacing of letters. The results indicated that students receiving three years of italic handwriting instruction scored higher than students receiving handwriting instruction in other styles. Students in grade 7, who had received three years of manuscript, two years of cursive and two years of italic instruction, had the lowest scores in legibility, suggesting that students are unable to maintain legibility during transition from one style to another. (HTH)

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AN EVALUATION OF THE SPEED AND LEGIBILITY OF ITALIC HANDWRITING

Dr. Betty Duvall

In the middle and late seventies it was apparent that the handwriting system being taught in the Great Falls, Montana, elementary schools was not effective. The need for change was apparent: (a) after many years of watching children struggle with the transition from a ball and stick manuscript to a completely different cursive form, and (b) after years of disappointment with the terminal writing of the students.

The program of handwriting used in the District was carefully evaluated in 1978-79. A committee of teachers searched the professional literature and examined commercial programs, including the one then being taught (Zaner-Bloser). The Committee found that there were about seventeen different commercial programs on the market. Those programs introduced the student to a print based on circles and verticle lines with a transition to a cursive handwriting based on elliptical slanted forms. The approach to these programs is in conflict with how children are educated. In other disciplines, children are provided with continuity of instruction; teachers build on previously developed concepts. A recurring question was, "Why should we teach children one set of letter forms for two to three years until they are just about able to master the skill and then discontinue this training to introduce a new, quite opposing set of letter forms?" T h e

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Committee determined that italic handwriting was not in conflict with concepts of sound instructional technique. The child begins as he will continue. The print letters introduced are based on an elliptical shape and are slightly slanted. These print letters are adapted to cursive handwriting by adding entrances and exits and joining the same letter forms taught in primary grades. The capital italic letters are simpler in form. (The infrequent use of capital letters made the perfection of the decorative cursive capital letters difficult to master.)

A curriculum guide was developed by a committee of teachers. The guide included learner outcomes, guidelines, and supplementary materials. The handwriting program, using italic letter forms, was instituted in the elementary schools in 1981 after piloting and evaluating the program for two years.

As a part of continuous program evaluation, the handwriting program was evaluated during the 1983-84 school year. For three years, students in grades K-6 had been receiving handwriting instruction using the italic letter forms. Prior to 1981, students were taught Zaner-Bloser manuscript with a transition to cursive. The chart below shows the grade level and the number of years of instruction in each style for the majority of the students. (A minority of students in grades 9, who attended schools where italic was piloted, would have received instruction in italic. This is not reflected on the chart below.)

NUMBER OF YEARS OF INSTRUCTION BY STYLE

Grade	Years of Instruction by Style		
	Italic	Manuscript	Cursive
1	2	0	0
2	3	0	0
3	3	1	0
4	3	2	0
5	3	3	0
6	3	3	1
7	2	3	2
9	0	3	4
11	0	3	4

Although handwriting is not formally taught in kindergarten in the district, students are exposed to the style of writing taught. Therefore, the year of kindergarten experience is reflected in the chart above.

Procedure for the Evaluation

On May 15, 1984, samples from all students in attendance in grades 1-6, 7, 9, and 11 were collected.

Students were directed to write a poem in their best writing. The students in grades 1-3 were given five minutes to write the poem (see Appendix):

> A peanut sat on the railraod track,
> His heart was all a flutter
> Chee-chee, train comes around the bend,
> Toot! Toot! Peanut Butter.

Students in grades 4-6, 7, 9, and 11 were given five minutes to write the poem (see Appendix):

The Planet of Mars

On the planet of Mars
They have clothes just like ours,
And they have the same shoes and same laces,
And they have the same charms and same graces,
And they have the same heads and same faces...
But not in the
Very same
Places.

S. Silverstein

All students were also asked to write the sentence: The quick brown fox jumps over the lazy dog. Students were instructed to write the sentence as many times as they could in their fastest writing. They were told they would be timed for one minute. Two one-minute timings were given. (Directions, as they were supplied to teachers, and sample tests can be found at the end of this report.)

After the samples were collected, they were sorted by grade level and counted. Fifty samples from each grade level were selected for evaluation by taking every 20th paper from the 1016 samples from grade 1 students, every 19th from the 975 from grade 2 students, every 16th from the 838 from grade 3 students, every 16th from the 804 from grade 4 students, every 14th from the 737 from grade 5 students, every 16th from the 838 from grade 6 students, every 16th from the 825 from grade 7 students, every 13th from the 684 from grade 9 students, and every 15th from the 756 from grade 11 students. The fifty samples to be evaluated were numbered 1-50.

A panel of judges consisting of one school board member, one parent, one member of the Handwriting Committee, and one

retired teacher evaluated the samples for legibility. Mean scores for the number of letters per minute were calculated for speed. The literature was reviewed to establish criteria for judging legibility and speed.

Review of the Literature with Regard to Legibility

Legibility is a major factor of handwriting skill. Anderson (1965) believed that it was the most important criteria for judging handwriting. Topetzes (1960) recognized the importance of both speed and legibility but believed that in the final analysis, good handwriting was best described in a qualitative rather than quantitative sense. McClamont (1958) and Carter (1953) agreed that the purpose of writing is for reading, and, therefore, in order to be good, writing must be easy to read.

Legibility can be described in terms of the length of time required to read handwritten selections. Ayres (1925) determined that the most important factors influencing legibility are spacing between words and spacing between lines. He also noted that vertical writing was the most legible and extreme slant the least legible. Quant (1958) stated that letter formation had a greater affect on legibility than any other single factor. She believed that the regularity of the slant had a deciding influence. Hildreth (1960) reported that perception studies show that as handwritten letter forms depart from the vertical, they become less legible. She stated, "....legibility is directly proportionate to the degree of similarity between machine printed type-face and hand writing style" (p. 5).

Another factor influencing legibility is amount of pressure applied. Harris and Rarick (1959) found that as the speed of handwriting increased, the amount of pressure increased in variability. This adversely affected legibility. Herrick (1960) cited one researcher, Judd, who found that a regular pressure exerted on the point and grip of a writing instrument was absent until about age eleven.

Criteria for Judging Legibility

A wide variety of factors seem to influence legibility. Five items were selected to judge legibility: size of writing, slant of writing, alignment of letters, form of letters, and spacing between letters, within parts of letters, between words, and between sentences. A five point rating scale was established--five indicated the highest rating and one the lowest.

Size of Writing. The size of the writing for the particular grade was in, or not in, agreement with common standards. Writing was rated with consideration for being too large, too small, and varying in size.

Slant of Writing. Consideration for slant were: too slanting, too vertical, and irregular (too many different slants).

Form of Letters. The formation of the letters should be consistant with the models taught. Considerations were: parts of letters disconnected, too angular, too round, too thin, beginning strokes, and ending strokes.

Alignment of letters. Letters should rest on the line. Considerations were: off the line in places, small letters

uneven in height.

Spacing. Spaces within letters, between letters, between words, between lines were assessed. Considerations were: too wide, crowded, and irregular.

Each sample was rated using the following scale.

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

RESULTS OF THE GREAT FALLS STUDY WITH REGARD TO LEGIBILITY

In this study, using the rating scale for legibility, the lowest score possible would be 5, the highest score would be 25, the average score would be 15. When the scores of the judges for each grade level were averaged, the mean scores by grade level were:

	1	2	3	4	5	6	7	9	11
Mean	15.96	17.06	16.58	15.78	15.29	16.15	13.87	14.44	15.15

According to the results of this study, students in grade 2 had the most legible writing, while students in grade 7 had the least legible writing. Scores in descending order by grade level from highest to lowest were: grade 2, grade 3, grade 6, grade 1, grade 4, grade 5, grade 11, grade 9, and grade 7.

For three years students in elementary grades had been instructed using italic letter forms. From the results of this study, it is shown that students receiving three years of italic handwriting instruc-

tion scored higher than students receiving handwriting instruction in other styles.

Students in grade 7 received the lowest scores in legibility. These students had received about three years of instruction in manuscript, two years of instruction in cursive, and two years of instruction in italic. The results of this study may indicate that students are unable to maintain legibility when transition from one style to another is required.

Observations of Judges Concerning Legibility

The judges expressed concern that the rating scale might not give a true picture of legibility, so an additional procedure was established. The samples from grades 3, 6, 7, 11 were used for this evaluation. Judges sorted the fifty samples from each grade level by visually deciding which were most legible, legible, and least legible. The number at the top of the samples were then recorded

The mean number chosen for each category by the judges and percentage of that number to the 50 samples are reported below by grade level:

Grade	Most Legible	Legible	Least Legible
3	27 (54%)	18 (36%)	4 (8%)
6	24 (48%)	22 (44%)	5 (10%)
7	17 (34%)	19 (38%)	14 (28%)
11	18 (36%)	20 (40%)	13 (26%)

Note. All numbers have been rounded.

This evaluation shows that 54% of the grade 3, 48% of the grade 6, 34% of the grade 7, and 36% of the grade 11 samples were considered most legible; 36% of the grade 3, 44% of the grade 6, 38% of the grade 7, and 40% of the grade 11 samples were considered legible; 8% of the grade 3, 10% of the grade 6, 28% of the grade 7, and 26% of the grade 11 were considered least legible. The differences in the percentage of samples of writing considered least legible would indicate the grade 7 and 11 students did not write as legibly as the students in grades 3 and 6. The information obtained from this procedure was commensurate with the information derived from using the rating scale.

Review of the Literature with Regard to Speed

Legibility and speed are considered equally important to handwriting efficiency. Enstrom (1964, 1965) concluded that one without the other is meaningless. He observed that legibility can disintegrate to scrawling under speed conditions, and so reasoned speed is a significant factor of handwriting efficiency.

In a dissertation study by Jackson (1970), speeds of manuscript and cursive were reported for 4, 5, and 6 grade students. Students in one school were taught only manuscript. Students in another school were taught manuscript with a transition to cursive during the first semester of third grade. Nine boys and nine girls were selected randomly from each intermediate grade level of the two schools. Pupils were matched according to: (a) grade level, (b) I.Q. level (high, medium, and low), and (c) sex. Pupils in the study were asked to write the sentence, "The quick brown fox jumps over the lazy dog."

The two groups wrote the sentence for exactly two minutes, first as well and as rapidly as they could and then as fast as they were able. Speed of handwriting was measured by the number of letters pupils wrote per minute. Speeds reported in that study were:

	Students in Grades 4, 5, and 6	
	As Well and As Rapidly	As Fast As You Can
Manuscript	47.81	74.81
Cursive	44.01	64.31

In the Scottish Educational Journal, Thomson (1954) reported studies of the superiority of the speed of italic over the cursive script. The sentence, "We are looking forward to our Christmas holidays." was given to classes (age approximately 11 years in two schools. The children were asked to write this first in ink in their "very best" handwriting, taking all the time and care they needed. They were then asked to write as many sentences as they could, for two minutes, at the speed they would use when writing an ordinary letter. Finally, they were asked to write as many sentences as possible in their fastest scribble for two minutes. Results are reported for the students fastest writing, though Thomson claimed the careful and the ordinary writing of the students showed a similar advantage for italic. Thomson reported that while the legibility and regularity of students' cursive writing decreased greatly when written rapidly, the students' italic writing was still legible and "good to look at." On the average, students wrote italic 6.4% faster than cursive.

Reported by Thomson (1954) were experiments by Mr. Percy Wood using number of words per minute instead of number of letters. Wood tested students writing italic in his own shcool against students using three other styles in ten other schools. The sentence chosen was, "The quick brown fox jumps over the lazy dog." The following chart shows the advantage of italic:

WORDS PER MINUTE

	A*	B	C			D					
Age 6+	6.3	3.2									
7+	7.4	4.7	3.8								
8+	9.7	7.9	5.3								
9+	14	9.9	5.3					4.5			
10+	17	12.5	3.9	9.4	5.7	5.3	4.9	9.1			
11-15	17								6.3	14.9	10.1
6+	8.2	3.9									
7+	11	8.3	6.5								
8+	13.5	11.3	7.2								
9+	19	13.3	7.7					7.9			
10+	21	17.6	6.5	15	9.1	10.4	11	14.8			
11-15	24								10	19.6	12.3
	a**	b	c	c	c	c	c	d	c	c	c

*Style of Writing
A--italic
B--Marion Richardson script
C--joined script
D--school copperplate

**School
a--Cholmondeley
b--Notts
c--Cheshire
d--Scotland

Lehman (1976) reports that the objective of a three year investigation in 1972-74, was to evaluate students being taught italic handwriting as a primary instructional alternative to the commonly-used manuscript and cursive. Six first grade classes were selected for the study. Beginning in September 1971, three classes studied italic and three studied manuscript as their basic first-grade handwriting instruction. One sample of the writing of the students was taken for evaluation the first year. In the third and final year of the project, children in both groups performed at the same level of competence with regard to letter slope, spacing, and scale. However, the students in the italic groups deviated from their letter models only half

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as much when it came to letter shape.

A speed test administered in May, 1976, was used to measure the 'normal' handwriting speed of the third grade students in a classroom setting. The average rate of production for the three classes writing cursive was 46.6 letters in two minutes or 23.3 letters per minute. The average rate of production for the three classes writing italic was 73.3 letters in two minutes or 36.65 letters per minute.

In a study at Kings Park, New York, (DiSpigno, 1978) the handwriting of students being taught italic was compared to the handwriting of students learning manuscript/Palmer. In September, 1976 700 kindergarten through grade six students in one school switched to italic handwriting instruction. In four other schools the use of manuscript with a transition to Palmer was continued.

A comparative study was conducted during the 1977-78 academic year in grades three through six. The students' italic writing was clearly more legible at every grade level of the randomly selected samples from 1800 students in grades 3-6. The margin of superiority ranged from 16.1% to 30.5%. Children wrote italic faster at grades three, four, and five. When legibility and appearance for the ten highest ranked samples selected from the students' writing from each school were compared, the italic writing was judged as good as the Palmer writing in grades 3 and 4 and better in grades five and six. The best writers using italic wrote almost 20 letters per minute faster in grades three, four, and five. The significant findings were related to the ten lowest ranked samples selected from the students' writing from each school. At every grade level, the samples of italic

writing were evaluated 50% better than Palmer. There were no significant differences between the speed of the poorest-ranked writers of italic and Palmer. The research evidence suggested that italic may be easier for poorer writers but not faster.

Ayers set some norms of handwriting rate in 1917. Fifth to eighth grade students practiced reading and writing part of the Gettysburg Address until they were familiar with it. They they wrote it for the test. Groff (1961) suggested the need for new speed norms of handwriting by criticizing the 1917 speed norms of Ayres. Groff had his middle grade subject become familiar with only the reading of the first three sntences of the Gettysburg Address before they wrote the passages for speed. The following speeds of handwriting were reported by Groff:

	PERCENT OF PUPILS					
LETTERS	GRADE					
	4 Ayres	4 Groff (N=1563)	5 Ayres	5 Groff (N=1522)	6 Ayres	6 Groff (N=1749)
10-19	-a	6.8	1	3.8	-	1.5
20-29	-	25.4	2	13.5	2	5.5
30-39	-	32.5	5	31.5	3	18.4
40-49	-	21.3	12	26.0	8	27.1
50-59	-	9.9	20	12.6	14	21.2
60-69	-	3.6	22	7.6	19	12.9
70-79	-	.8	19	3.2	21	7.9
80-89	-	.3	12	.8	16	3.6
90-99	-	.1	5	.4	10	.9
100-109	-	-	2	.4	5	.8
110-119	-	-	-	-	2	.4
Mean =	55	35.06	64	40.65	71	49.65

Note. From an article by Patrick J. Groff published in the December 1961 Elementary English.
[a]Percentages not reported.

Freeman (1954) suggested some norms of handwriting rate which gained wide acceptance and have been frequently mention in the literature over the years. He simply averaged the averages of the norms which had been previously reported in research studies. His norms suggested the following average speeds in letters per minute for the given grade levels.

Grade	2	3	4	5	6	7	8
Speed	30	40	50	60	67	74	80

Note. From Frank N. Freeman, "Teaching Handwriting." What Research Says to the Teacher, No. 4, NEA (1954), p. 4.

As a part of analyzing reading anomalies, Durrell (1955) considered the rate of handwriting. The material to copy was on the appropriate reading grade level. His reported scores fell between those of Groff and Freeman:

Grade	2	3	4	5	6
Speed	25	35	45	55	65

REPORT OF THE GREAT FALLS EVALUATION WITH REGARD TO SPEED

The number of letters written in one minute was used to calculate speed. Each student was given two one-minute timings writing the sentence: The quick brown fox jumps over the lazy dog. The first timing was considered a practice. The number of letters for the second timing for the fifty selected samples was tabulated and the means reported as follows:

Mean Letters Per Minute

Grade	1	2	3	4	5	6	7	9	11
	32	44	64	88	102	113	115	121	146

Students in this study in grades 3-6, 7, 9, 11 outperformed students in all other studies reported in the literature. The speed for grades one and two reported for italic writing by Thomson (1954) were four letters higher than the speed of the students in this study. Scores for italic writing as reported by Thomson (1954) of the Wood study most nearly reflect the results of this study for all grade levels.

Students appear to be able to write more letters per minute as they get progressively older (as cited in all the studies reported.) This may be due to maturation.

Mean Letters Per Minute Written as Reported in Various Studies

Study	Grade Level									
	1	2	3	4	5	6	7	8	9	11
Jackson (1970)										
Manuscript					75					
Cursive					64					
Wood (reported by Thomson (1954))b										
Italic	36a	40	59	84	92		105			
Richardson script	17	37	50	59	77					
Joined script	-	29	32	34	29					
School copperplate				35	53		61			
Lehman (1976)										
Cursive			23							
Italic			37							
Ayres (1917)					55	64	71			
Groft (1961)					35	41	50			
Freeman (1954)	-	30	40	50	60	67	74	80		
Durrell (1955)	-	25	35	45	55	65				
Duvall (1984)	32	44	64	88	102	113	115	121	146	

Note. All means are rounded off. When the study reported the style of writing, the style is reported on this chart. An assumption would be that the study by Ayres reported speeds for cursive, by Groft reported speeds for cursive, by Freeman reported speeds for manuscript in grades 2 and 3 and cursive in grades 4-8, by Durrell reported speeds for manuscript and cursive, by Duvall reported speeds for mixed styles.
aMeans converted from words per minute to letters per minute.
bAges reported were converted to grade level.

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CONCLUSIONS

Handwriting of the students in grades 1-6, 7, 9, and 11 was evaluated in 1984. Italic handwriting had been used for instruction for three years. Prior to that, Zaner-Bloser manuscript was instructed in primary with a transition to cursive in the third grade.

From the samples of students in attendance on the date of testing, fifty random samples were selected from each grade level for evaluation. These samples were evaluated by a panel of judges for legibility and speed.

Legibility of the students in grades 1-6, who had been taught italic handwriting for three year, were higher than scores of students in grades 7, 9, and 11. Students in grade 7 received the lowest mean score of the grades tested. Those students had been instructed in Zaner-Bloser manuscript for three years, in Zaner-Bloser cursive for two years, and in italic for two years. A conclusion might be that transition in styles of writing was not conducive to legible writing.

Students in this study in grades 3-6, 7, 9, and 11 wrote faster than students in any other study reported in the literature. The speed for grades one and two reported for italic writing by Thomson (1954) were four letters higher than the speed of the students in this study. Mean scores for italic writing as reported by Thomson most nearly reflect the results of this study for all grade levels and were higher than speeds reported in any of the other studies. Students in this study, and in

the studies reviewed in the literature, wrote progressively faster from lower to upper grades regardless of the style of handwriting taught.

The results of this study indicate: that students, who have received three years of instruction in italic handwriting, write more legible that students who have been taught manuscript with a transition to cursive and students who have been taught manuscript, cursive, and received only two years of instruction in italic.

The speed of the students in this study in grades 1-6 writing italic was superior to speeds reported for manuscript, cursive, Richardson script, joined script, and school copperplate. The students in grades 3-6 wrote italic twice as fast as students were reported to have written manuscript/cursive in several of the studies.

The results of the 1983-84 evaluation of handwriting of the students in the Great Falls Public Schools indicates that students taught italic for three years write legibly and quickly. The legibility of the writing of students who were taught italic was measurably superior to the legibility of students taught manuscript/cursive. The speed of writing of students in the Great Falls Schools was superior, in nearly every case, to the speeds of writing of students reported in the literature. As a result of this evaluation of speed and legibility, the recommendation is made to continue the current handwriting program.

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GREAT FALLS PUBLIC SCHOOLS
Great Falls, Montana

To: Teachers and Principals
From: Betty Duvall, Curriculum Coordinator
Re: Handwriting Evaluation

The Handwriting Committee was directed by the Board to conduct a study to evaluate the handwriting program. The Committee requests that you collect handwriting samples from your students on May 15, 1984. Please follow this procedure:

1. COPY A POEM

a. Give each student a copy of the evaluation form. Ask students to fill in the top and lay down their pencils when finished.
b. Read the poem to, then with, the students.
c. Give the following directions: "You will have five minutes to copy this poem. Please write in your best writing. You should have enough time to write the poem but at the end of five minutes you will be asked to stop. If you finish before I say stop, please wait quietly."
d. Ask students to begin, and time them for five minutes. Ask students to stop and turn their paper over.

2. TIMED WRITING

a. Read the sentence at the top of the page to, then with, the students.
b. Ask the students to practice writing the sentence on the top two lines, then lay their pencils down.
c. Give the following directions: "I would like you to write the sentence as many times as you can in your fastest writing. I will time you for one minute. Please do not begin until I say begin. Please write the sentence as many times as you can. Write as fast as you can, but remember I should be able to read it. At the end of one minute I will ask you to stop and put your pencil down."
d. Ask the students to pick up pencils and begin. Time for minute. Ask students to stop and count the number of letters, write the number of letters in the circle at the end of this set of lines.
e. Repeat the one minute timing.
f. Collect papers and sent to:

Betty Duvall
Administration Building

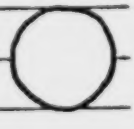
NAME _____ GRADE _____
SCHOOL _____

The Planet of Mars

On the planet of Mars
They have clothes just like ours.
And they have the same shoes and same laces.
And they have the same charms and same graces.
And they have the same heads and same faces...
But not in the
Very same
Places.

S. Silverstein

The quick brown fox jumps over the lazy dog.



NAME _____ GRADE _____

SCHOOL _____

A peanut sat on the railroad track,
His heart was all a flutter
Chee-chee, train comes around the bend,
Toot! Toot! Peanut Butter.

GRADE _____

Student # 1

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 2

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 3

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 4

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 5

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 6

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 7

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____

Student # 8

Size	5	4	3	2	1
Slant	5	4	3	2	1
Letters	5	4	3	2	1
Alignment	5	4	3	2	1
Spacing	5	4	3	2	1

Total_____